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2) Describe how science can be a sustainability problem; referencing at least four examples from films you watched this semester.

The scientific and technological innovations of the last century have allowed humans to prosper across the world. The life expectancy has increased, people have set foot on the moon, and cell phones and the Internet emerged. However, humans are just starting to learn the impact that all these innovations have on the planet. This essay will examine four scientific and technological innovations that have created sustainability problems around the world. These innovations include industrial pesticides, cars, industrial fishing methods, and antibiotics.

When first developed pesticides were a miracle for farmers allowing them to save more of their crop each year because they could kill the crops natural predators. However, as more is learned about pesticides the harm that pesticides can do has emerged. Pesticides have been shown to cause severe health effects even in the long term as the chemicals build up in the body overtime. Pesticides are a great example of a seemingly amazing product that help humans in some ways but seriously harm them in other ways. Food Inc. looked at how pesticides have grown to become common farming products as a result of the rise of monocultures (1). In order to keep monoculture plants alive, farmers must use vast amounts of fertilizer due to a lack of biodiversity in their fields. Science has allowed for the growth of monocultures and created pesticides to help as a result. Without these scientific innovations farmers would not have the need for pesticides.

The development of cars in the 19th century marked a major innovation for the human race but it also marked a turn towards increased pollution. Originally cars were only for the rich but over time improvements in manufacturing techniques have led to decreased costs of car. This has caused cars to become more available to the general public and in fact cars have become a daily, essential part of life for the majority of American (2). Technological improvements have also lead to more efficient cars that have better gas mileage and that produce less pollution from the environment. Better fuel economy and lower costs of buying a car however all leads towards one thing, more people driving. The ability of more people to have and drive cars has led to significant increases in pollution that is a major contributor to global warming. Cars as they stand today are unsustainable and without more major technological innovations the car might be nearing the end of its days.

In the film *The End of the Line* one of the interviewees described the current industrial fishing as “we are fighting a war against fish and we are winning” (3). Gone are the days where finishing was a small local business, now there is a giant global industry that dominates the world’s

oceans. Advances in fishing technology include fish trackers that help fisherman find large swarms of fish, trolling where baited lures or large nets are dragged along the ocean floor, giant fish boats and shipping crates that allow for frozen fish to avoid spoil. All these technological innovations and the large scale of the fishing industry are significant hazards to the ecology of the world's oceans. Fishing innovations have allowed for large scale fishing operations that are currently decimating the world's oceans. Without technological advances people would not be able to decimate the world's fish like they have and thus technology has assisted in the creation of an unsustainable industry.

Perhaps the greatest innovation of the 20th century was the development of antibiotics and anti-viral medicines. These medicines have led to the near extinction of certain diseases that for thousands of years killed thousands of people every year. However, nature has a way of adapting. Over the years as antibiotics became more prevalent in society scientists begin to find drug-resistant strains of bacteria they were previously able to cure people from. This led to more antibiotics and giving people more and more drugs to fight strains that were previously killed with one dose. Science allowed for great achievements in medicine but it also led to evolutions in bacteria that make them all the more deadly to humans. A great example of this can be found in the film *Fresh* where a farm describes the use of antibiotics on an industrialized farm. As an industrialized farm the pigs were kept in really close quarters to each other and this required the farmer to continuously inject his stock with antibiotics to prevent the spread of disease. This overuse of antibiotics helped to create a drug resistant infection. One day when the farmer was gored in the leg by a pig he managed to pick up one of these drug resistant infections. He ended up spending weeks in the hospital trying to heal on various strains of antibiotics. Finally he was saved by a brand new drug (4). This farmer is an important example about the overuse of antibiotics can create deadly viruses that will require more powerful medicine to kill. As this cycle continues the question becomes what happens when the medicine cannot compete any more.

Science and technology are important elements in pushing the human race forward. However, they can also contribute to ecological and environmental hazards that in turn threaten the human race. Scientists need to be more cautious about their innovations and examine all the possible outcomes before proclaiming it the miracle they believe it to be.

3) Discuss the relationship between mainstream media and sustainability. Include at least four references from your work this semester.

Mainstream media and sustainability have an interesting relationship because they are at once enemies and befriends. Mainstream media uses sustainability to sell products through "green washing" but it also is used to promote consumerism which is harmful to sustainability. The mainstream media is also important to sustainability because it can be used to promote awareness of sustainability and reach large amounts of people.

“Green washing” is a marketing device that is used to promote supposable green products by suggesting they are environmentally friendly. However there are no firm guidelines on what can be considered environmentally friendly, so marketing teams can use green washing to promote products that they determine to be environmentally friendly, this can be seen in the film *The Persuaders* where corporations attempt to devise strategies to lead people towards their products (5). Marketing does not necessarily care about the products its selling only that it sells. This marketing strategy is promoted by mainstream media because the new hip and healthy this is to be green. Mainstream media tells consumers that going green is important and they should buy products that are environmentally friendly. The marketers know this and then use this to promote “green” products that the consumers will want to buy. An example of this can be seen in the film *Not Business as Usual* where a clothing manufacturer begins his journey towards sustainability after a customer asks if he carries low impact clothing (6). This question led him to develop Eco Apparel with the goal of making low impact clothing. However, he does not really understand how to make eco-friendly clothes so he makes several claims he could not substantiate. The consumer does not know this though so they take Eco-Apparel at face value and assume that it is a green company despite a lack of evidence. Though Eco-Apparel did turn itself around to become more environmentally friendly in reality not every product does that. The market manipulates people’s desires to be more sustainable by creating products that promote a greener life style without actually providing the factual evidence to back up the claims. Mainstream media promotion of living green is an interesting relationship with sustainability. Obviously, it is important to sustainable effort to promote people to live greener lifestyle but the manipulation of the term “green” by marketers is hurting the sustainability crusade. Consumers can fall prey to misinformation if they do not truly understand sustainability.

Mainstream media is an important factor in consumerism because it promotes the cultural belief that more is always better. Mainstream media is dominated by stars that have big houses and lots of cars; they are promoted as people who have the American dream. The media leads people that they need stuff to have lives of glamour and fun like the movie stars. However, this consumerism is not sustainable. The mainstream media does not divulge the negative effects of consumerism such as waste and pollution. In the film *The Blind Spot*, big oil is linked to consumerism (7). The film discusses how much oil goes into making food and clothes and energy. Consumerism is supported by oil because it allows for cheap transportation of goods from around the world and cheaper food harvested by oil fueled machines. Mainstream media ignore the negative effects of consumerism but it also promotes limiting oil use which is an oxymoron. Mainstream media also promotes consumerism with the idea of urban sprawl. The media maintains the American dream where success is a house in the suburbs with 2.5 kids and a dog. However as the film *The End of Suburbia* explains this idea of urban sprawl is not sustainable (2). Consumerism promotes moving into big house and driving big cars because these are objects that are used to demonstrate the wealth. This idea however is not sustainable because the suburbs create areas that disrupt the natural landscape and help promote air pollution through car use, and lead to an extensive amount of impermeable surfaces. The mainstream media does not share this information with the

public when it promotes the suburban life style, it ignores the unsustainability of the American dream, choosing instead to only share the sunny side of a happy life style that is only complete with vast amounts of consumerism.

The mainstream media wields large amounts of power over the population because it is a distributor of information. Sustainability ideas and actions need to be distributed by the media but right now the media is not doing an effective job of this. They are failing to truly inform the average citizen of the importance of sustainable efforts and the need to be more sustainable.

6) Describe a film idea intended to educate a particular audience about a sustainability problem. Describe the audience you intend to reach, and its characteristics (biases, ignorance, expertise, etc); the aim of the film; its narrative structure and its content.

One of the most important aspects to sustainability is education. It is necessary to educate people on the need for sustainable practice, what they can do to become more sustainable, and most importantly what unsustainable practices should be avoided. There is however a struggle over how to most effectively disseminate this information to the public. The public needs to not only become informed of sustainability issues but also to be incited to action to become more sustainable. Sustainability education has not always been available to people, the discussion of sustainable practices has only been talked about over last few decades so many people still do not understand the need for sustainability. In order for the world to understand sustainability they need to be educated.

A film should be created that looks at the problems of sustainable education over time. It would be a historical narrative that would walk the audience through the development of the concept of sustainability and how developed as people began to understand the effects that the industrial age was having on the world. The film would analyze how the concept of sustainability has evolved and how is a reaction to the various environmental, cultural, and political problems seen in the world today. The first part of the film would look into the industrial revolution and the negative environmental impacts that have developed as a result of the world's lack of foresight into the cause and effect of pollution. The film would then transition into the beginning of the sustainable efforts with the evidence that led people to realize activities like burning coal day and night was not good for the world. This transition would be analyzed in depth because when people began to understand the harm of pollution they made the decision to make slight changes not drastic changes. People saw the sustainability problems developing around them and they began to understand the impact yet today pollution is still a major problem despite its harmful effects being learned long ago.

The film would then move into sustainability education and the development of sustainability awareness in society overtime. This would include such things as the development of earth day

and legislation that was passed by the government to make the countries major businesses and practice more sustainable. It would also be important during this time to analyze the push back to sustainable legislature and its effects on the sustainability movement. As seen in the film *The End of the Line* and the film *Poisoned Waters*, people are often resistant to the idea of sustainable legislature that has the possibility of the bottom line. In *The End of the Line*, fisherman became infuriated when Canada imposed harsh fishing regulations in an attempt to sustain its fish pollution and allow its number to recuperate (3). Towns that lived off of the fishing industry were furious that the government would attempt to take away their livelihood. The film *Poisoned Waters* looked at the effect of big industry in the government's attempts to impose regulations. During the film they discussed how the government attempted to impose regulations on industrial farmers to address the problem of water pollution from industrial farms, but big business got the regulations down to guidelines that are optional for farmers to do (8). The reaction to sustainable effort is important because it helps shows the obstacle to progress. Lots of people know what needs to be done to create a sustainable world for the future, however not many people are willing to move towards the future if it will have a negative effect on their daily lives.

Finally the film would end looking at how sustainability is understood to day in society. A lot of people are still not aware of what living sustainably is and the factor leading to this ignorance needs to be explored to understand how to fix it in the future. It would be important to address how sustainability is understood, how much green washing effect society, and the positive and negative steps the world has seen in the sustainability push. Understanding where the sustainability of the world is today is an important step in developing a sustainability road for tomorrow.

The audience of the film would be people studying sustainability and educator teaching sustainability because the goal would be to teach people about the evolution of sustainability over time. The film would address the lack of sustainability education in schools and the world and suggest future efforts that could improve this. A lack of education is a major obstacle to a sustainable future because so many people do not realize the world of the past and present will not be the world of tomorrow without intervention. The film should emphasize the difficulty of creating a sustainable world by analyzing past failed sustainable efforts. This is significant because on an individual scale trying to be more sustainable is easy but getting the world to move towards sustainability is much harder.

7) Explain five (5) actions that you think the average citizens can/should take to advance sustainability. Include concrete examples to illustrate your ideas.

Sustainability is something that can be practice by anyone on personal, social, and professional levels. Everyday a person is faced with thousands of choices that do not significantly impact their lives but can be an important step towards improving the world's sustainability. People do not need to wait for sustainable practices to be implemented or mandated by the government,

they can do simple things at home or in their community that help to move the world towards a sustainable future.

Individuals are the backbone of any community and a single individual making a pathway towards sustainability can lead to a whole community. A prime example of this is the Growing Power farm in Milwaukee where Will Allen has transformed empty lots into a flourishing community farm (4). Growing Power aims for sustainable food production as well as helping the community through introduction of local, fresh food. The film showed how the farm is able to produce healthy fresh food in a relatively limited amount of space. This is important because it demonstrates how the average citizen can utilize even the small amount of space in their backyard to grow fresh food. Another important factor in Growing Power's farm is its cyclic nature. The farm is set up to cycle water throughout it using plants and other systems to filter it which leads to minimum losses. This could be too large scale for the average citizen but a community could come together to create a system like this for a community garden. I think the average citizen or average community could create a garden to produce fresh food that is healthier and more sustainable. Even though a small garden cannot completely replace the average diet, it is an important step in the direction of sustainability and can be built up over time.

Transportation is a major environmental drain that the majority of people come into contact every day so it is easy to make more sustainable choices that overtime can have a really big impact. For the average citizen it can be easy to become more sustainable in their transportation choices, some of which are outline in the film *The End of Suburbia* (2). The film suggests stepping away from suburbia and moving back to cities. This would help to decrease the need for transportation because all of the citizens needs would theoretical either within walking distance or accessible through public transportation. Living in the suburbs requires a car to get to the store, school, or work, moving to a city helps to eliminate the need for a car. Suburbia also is not ideal for public transportation because of how spread out people and stops are so it is not feasible in many cases. However, moving to the city might not be feasible for the average citizen. Another option that is easier for the average citizen is to join a car pool. This still decreases the carbon footprint and the helps to reduce traffic.

Consumer Power is an important tool that every consumer can use to increase their sustainable efforts. Many products contain materials that come from unsustainable sources and food sources can come from unsustainable wild populations or unsustainable commercial farms. If a citizen becomes aware for the harmful effects their money is allowing they can choose to make more sustainable purchases in the future. An example of an unsustainable food source is the wild fish populations discussed in the film *The End of the Line* (3). These fish populations are disappearing at a significant rate yet most citizens do not know this threat. There is still the belief that wild caught fish is healthier and better for the environment so people continue to buy wild caught fish supporting the industry that could cause the extinction of many important species. Fish is perhaps the only food that can be labeled as critically endanger and still eaten by so much

of the world. If a citizen works to make themselves aware of unsustainable food and other products, they can make more sustainably minded purchases and thus use their buying power to hopefully move industry in a more sustainable direction.

Water usage is something that most US citizens take for granted but it something a lot of citizens should look at decreasing to become more sustainable. Making clean water is no easy task and it requires lots of energy to run water treatment plants and then filter water to homes. The film *Poisoned Waters* explores human's effects on water especially the usage in city and water treatment plants (8). In the film they mentioned that water treatment plants should constantly be upgraded to account for new chemical in the water. Each day citizens use water that goes to treatment plants but many do not think about what they are putting down their drains or how much of it they are using. Citizens should try to buy products that are environmental friendly and will not poison the water supply like many industrial cleaners. Citizens can also be aware of how much water they are using and put efforts towards decreasing that amount such as taking shorter showers or getting high efficiency appliances.

Another sustainability problem is the vast amount of energy people consume every day. A lot of the energy used today has its origins in oil. The world is facing an imminent crisis as the peak of oil approaches and yet so much of the modern world relies heavily on oil. Every day, the average citizen interacts with the products of oil whether food, clothes, or electricity. To move away from oil dependence a citizen might consider how they can decrease or improve their energy usage. To decrease energy usage a citizen might consider lowering household heating or buying energy efficient light bulbs. More ambitious citizens might consider replacing their standard electricity with solar energy. Solar panels on houses help to move away from the grid and the power comes from a much more sustainable source than standard electricity.

To improve their sustainable imprint citizens have a plethora of options, some of which are outlined above. The main thing that a citizen can do to become more sustainable is to educate themselves about sustainability and then used those lessons to make small impacts every day.

8) Explain five (5) actions that you think the US government should take to advance sustainability. Include concrete examples to illustrate your ideas.

Creating a sustainable system is necessary if people want to continue to live on earth. The past has seen many goals set by environmental agencies that are meant to discourage pollution and encourage people and corporations to decrease carbon emissions or use of hazardous chemicals. However, these goals are often ignored because they have no backbone to them. In order for sustainability efforts to be effective and for the world to see a positive change governments need to set legislature that forces people to move towards sustainability. This essay will outline 5 actions the US government should take in order to make the US a more sustainable country.

The US government should give tax breaks on local food and provide subsidies to local, sustainable farms. In the system set up today large scale corn producers receive large subsidies from the federal government to support their production. Small scale farms are largely ignored however. The government needs to work to promote small, sustainable farms because these farms are necessary to move away from industrial agriculture. Local sourced food is more sustainable because it's easy to obtain and is a healthier option. The tax breaks and subsidies would help make locally sourced food a more economic option for the more Americans.

The government also needs to work to enforce international fishing quotas and work to make sure unsustainably sourced seafood does not land on American plates. As seen in the film *The End of the Line*, the international fishing quotas are largely ignored by many of the industrial fishing corporations because there is no real enforcement of the system (3). The US government needs to step up and be one of the enforcement agencies because the fishing industry is causing the endangerment of many valuable species that are important to biodiversity. The government should regulate what restaurants are allowed to sell to ensure that endangered species do not end up on the menu. These actions will hopefully lead a global movement to stop unsustainably sourced fish from being eaten and help the wild population to recuperate from decades of overfishing.

The US government needs to make regulations to decrease the US dependence on oil. The US is facing collapse if the oil is used up. Much of the US economy depends on the use of oil that if the oil begins to deplete at rapid rates or the cost of oil is significantly increased the US becomes very vulnerable (9). The US should give tax breaks to citizens who switch to electric cars as an incentive move people towards sustainability. Electric cars, even hybrid cars, are an important step in moving the US away from the dependence on oil and towards a more sustainable future. The government could also introduce new gasoline taxes which would incentives people to find more sustainable ways of traveling due to financial pressure. Transportation is a major factor when considering the US dependence on oil, helping the country move off oil through incentives will save the US when the oil begins to disappear.

The US political system is currently unsustainable and the government needs to take steps towards improving the system if they want to avoid collapse. In the last few decades of elections Super PACs have emerged as the political candidates sources of funding. PAC stands for political action committee and it is an organization that pools campaign contributions and then donates those funds to campaigns (10). The reason super PACs are a problem for the US political system is that the PACs take power away from the everyday citizen and give power to corporations who can make large donations to super PACs that can be used to sway decisions. Super PACs are used by candidates to help fund their campaigns, but then the candidate is under the expectations to follow along with the super PACs beliefs and goals. These super PACs can get a lot more money to candidates than individual voters can. The US government needs to take measure to restore the power of the government to the people. This political system that is only

held up by vast amounts of money is slowly unraveling in front of its citizens. The government needs to do something to help restore the citizens to power and regain their trust.

Finally, the US government should work to decrease the amount of ethanol that is produced and used. There is a concept that because ethanol is a biofuel it produces less admissions than gasoline and is better for the environment. During the fuel cycle ethanol GHG emissions are typically 30-90% lower than those for gasoline or diesel fuel (11), the fuel cycle is not the whole story. When the indirect emissions of ethanol are taken into effect, such as land use and the emissions required to produce the corn, ethanol can be shown to have even greater emissions than petroleum products. Yet the government continues to provide corn subsidies and tax breaks on corn on the belief that ethanol is better for the environment. The government could move the money spent on helping corn and ethanol to better use helping local farms produce food.

The US government needs to be a leader in the United States movement towards a sustainable future. Without governmental regulation the country will not be able to take big enough leaps towards sustainability in order to save the future.

12) What attitudes and cultural constructs in the United States do environmental educators need to work against? Briefly describe at least one activity for k-12 students that would work against these attitudes and cultural constructs. Reference at least two films.

Today's children are world's future and yet are these children up to the task of taking on the world's burdens that current generations are creating. It is important the children of today understand the environmental problems that they will have to face in the future. Children of today are products of generations of consumerism and waste that they most likely will bring into their adulthood. Today adults hear about climate change and pollution and imagine that it will have no effect on them because they can live the American dream. The children of the future might not have the luxury of ignoring the environmental problems around them.

One major cultural construct that educators need to actively work against is the idea of consumerism that is so prevalent throughout American society. There is the belief that having more stuff is always better. The film *The Persuaders* describes in detail how much Americans and other developed countries love to buy things (5). People love to buy things so much that there are whole industries devoted to encouraging people to buy more stuff. People can be convinced that they need more useless things because society defines success in terms of "stuff". Teachers need to work against the idea that buying things is the end all be all of everything. Though on the surface consumerism might seem like a relatively harmless thing, this cultural construct actually has significant environmental impact on the world. Waste is a product that goes hand in hand with consumerism because the more people buy the more they throw out. In order to feed consumerism industry has been pushed to provide things more and more cheaply

and in larger and larger quantity. This leads to more pollution in the air as environmentally unfriendly factors grow larger and larger and it also pushes for cheaper and cheaper labor as industry looks to cut costs.

It's difficult to explain to future generations the impact that consumerism has because it's hard to make the connection between giant shopping malls and forest or rivers half way around the world. It is important to establish the link between environmental degradation and consumerism. One film that does this particularly well is the film *The End of Suburbia* (2). In the film they analyze how people want bigger houses for cheaper and that has led to the phenomena of urban sprawl. Cheaper houses mean cheaper land and cheap land is found in rural not urban environments. Using the idea of urban sprawl as a demonstration of the bad environmental effects would help children to understand pollutions and the effects of consumerism. The students could have the choice of houses with large mansions far away from the city center and small apartments near the city center. Each time the students needed to use a car or heat their house, their carbon footprint would be increased. The student could play out several days of this and the student with the smallest footprint would win. This would hopefully help to teach the students the impact that urban sprawl and the drive to always have more has on the earth's environment. As a bonus this lesson could transition into a lesson on the negative effects that cars and other forms of energy use have on the environment.

Another cultural attitude that teachers have to work against is the idea that climate change is a natural thing. Recent years have seen a drop in the belief that climate change is caused by humans, studies show that while 66% of Americans believe global warming is happening but only 46% of those people believe that global warming is a result of human activities (12). This means that less than half of the population believed that global warming is a direct result of human activities despite scientific evidence to the contrary. This belief removes humans from fault as the environment slowly degrades. Children need to learn that the environment is not a static thing that will withstand the test of time; they need to learn the humans have a direct impact on the environment and are a significant factor in climate change. Parents are teaching their children that climate change of this scale is natural which means that the children will be encouraged to follow in the footsteps of their parents and continue the harmful cycle of environmental degradation. Educators are an important step in helping to end this belief. Teachers should be encouraged to show how the drastic climate change being experienced in the 21st century is a direct result of human activities. The educators cannot allow children to hold that belief that humans are not responsible for the environmental problems seen today.

Teachers are in a unique position in that they can work with future generations to help move the earth in a more sustainable and environmentally friendly direction. There are many cultural barriers to moving towards a sustainable world especially when people always want more and ignore scientific evidence. Teachers can help remove those barriers for future generations through education.

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